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[This Drawing is a reproduction of the Original on a reduced scale]

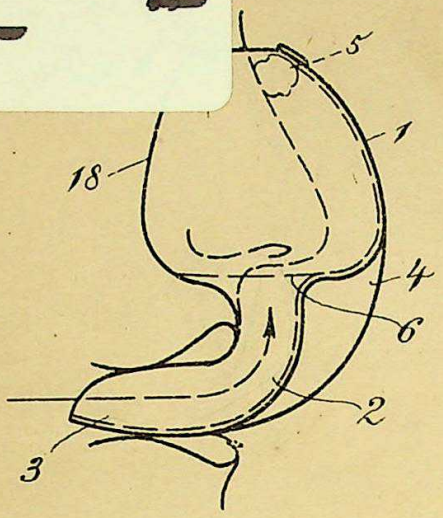

Fig. 2

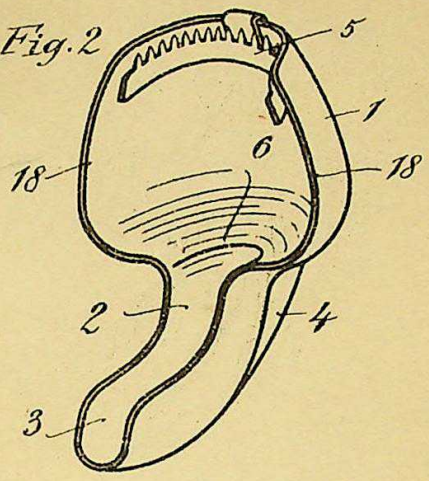

Fig. 3

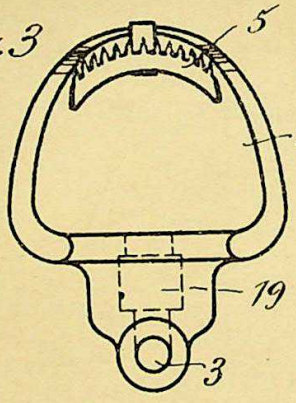

Fig. 4

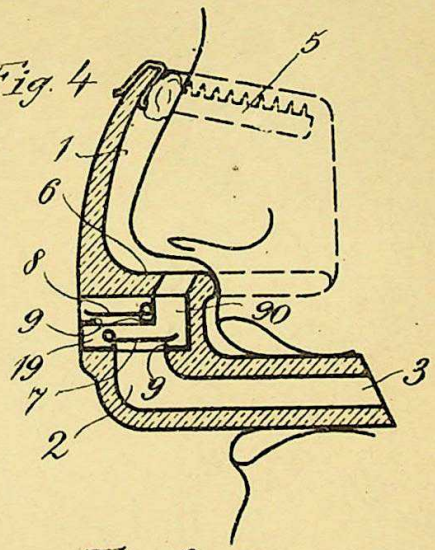

Fig. 5

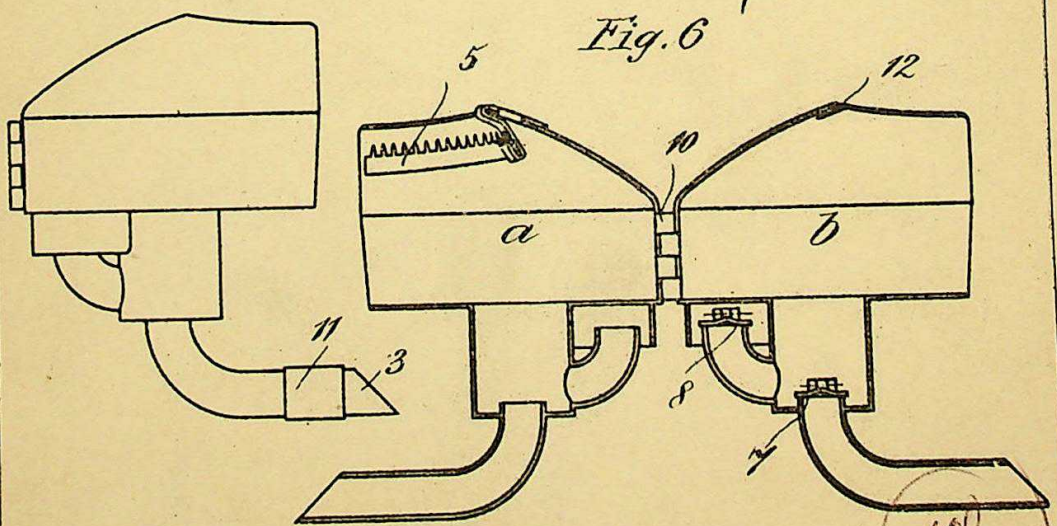

Fig. 6

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BRITISH

PATENT SPECIFICATION

Application Date: Mar. 16, 1921. No. 8253/21. 177,393

Complete Accepted: Mar. 30, 1922.

COMPLETE SPECIFICATION.

A Device for Enabling a Person to Test the Odour of his Own Breath.

I, KURT DIENER, of 16, Maasstraat, Rotterdam, Holland, of German nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to a device for enabling a person to test the odour of his own breath. As anyone can easily verify for himself, it is in general impossible, when breathing out into the open air, to be sure of the odour of the air expired by himself. Such a test is however of great importance from the health point of view, as the odour of the expired air is in many cases a sign of diseases of the mouth and throat, the stomach and other internal organs. By the regular use of my device anyone is in a position to ascertain for himself any slight variations in the expired air and to consult a doctor in time, before an incipient illness should break out.

Apart from the importance of my apparatus from the health point of view, it is important for everyone to be aware of the fact when his breath is bad and to take steps to remove the cause, so as not to be unpleasant to other people.

The apparatus has in the first place to convey the air, which is in the mouth, to the nose along as short a path as possible. Dead spaces should as far as possible be avoided in the apparatus. Hence it should be possible by a quite light inspiration through the nose to bring the air from the mouth to the olfactory nerves.

An essential feature of the invention consists of the hollow space for the reception of the nose, terminating immediately below the nose, and, on the apparatus being placed against the face, forming a tight joint at this point and additionally in a connecting channel commencing where the hollow space terminates, the other end of which is bent round towards the mouth and is introduced into the mouth.

In the accompanying drawing several constructional forms of the invention are shown. Fig. 1 shows one arrangement in side elevation in use and Fig. 2 the same arrangement seen in perspective from the side which is laid against the face. Fig. 3 is an elevation of another constructional form, seen from the side which is applied to the face. Fig. 4 is a longitudinal section, the apparatus shown in these two figures being made of a ceramic material *e.g.* porcelain. Figs. 5 and 6 show an apparatus made of metal, Fig. 5 being a side elevation and Fig. 6 showing the apparatus opened out.

In the first, Figure 1 is the hollow space for the nose, which terminates immediately below the nose, and the outer limiting edges of which rest against the face and thus close the space to the outside. The connecting channel 2 leading to the mouth piece 3 opens into the bottom surface 6 of the hollow space. 4 is a stiffening rib, which at the same time is adapted to hold the apparatus when in use. A resilient material such as cotton wool, which is wrapped on a serrated strip 5 clamped to the upper edge of the apparatus, makes the latter fit snugly to the bridge of the nose.

When in use the apparatus is put on as shown in Fig. 1. The hollow space for the nose is thus sealed to the outside in all directions. If air be now inhaled through the nose, it can only reach the nose through the mouth piece 3 and the con-

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necting channel 2 from the mouth. In many cases a single inspiration of air from the mouth will suffice for ascertaining the state of the expired air. Should several breaths be required, the apparatus is preferably removed, when it is desired to expire the air drawn into the nose and the process is repeated as often as necessary. As the hollow space for the nose and the passage to the mouth are small and restricted, the air will be able to reach the nose almost without any admixtures, which ensures a reliable test. Hence the apparatus will be found to be exceedingly sensitive. Although only light breaths need be taken, it will be possible to ascertain with certainty what is the state of the air expired.

The connecting channel 2 can be either open or closed. If it is made open, as shown in the drawing, the apparatus will be much simpler and cheaper, as it can be made with an open mould. This will also enable it to be very easily cleaned, as the interior is completely accessible.

If the channel is a closed one, it is either made closed in the first instance or it is subsequently closed by a cover, which may be removable, so that the advantage of easy cleaning is retained.

Different apparatus can be made to fit different shapes of faces, but in general a few models will be found to be sufficient, as the apparatus adapts itself well to different forms of faces and it is found that even a beard does not interfere with its use.

Figs. 3—6 show improved modifications of this apparatus with which several consecutive breaths may be taken without it being necessary to take off the apparatus after each inspiration through the nose. For this purpose valves are provided, which prevent the air expired from the nose from returning to the mouth, which would interfere with the result of the test. The nose rests in the hollow space 1, while 2 is a connecting channel leading to the mouthpiece 3. Between the mouthpiece and the hollow space for the nose valves 7 and 8 are fitted. These valves are in a common frame 90 and are adapted to be withdrawn from the front for cleaning purposes.

If the apparatus be put on in the manner shown in Fig. 4 and air be drawn in through the nose, the air from the mouth passes through the mouthpiece 3, the channel 2, opens the valve 7 and passes from there into the nose. On the air being expired from the nose, it closes the valve 7 but opens the valve 8 and passes into the atmosphere.

The valves 7 and 8 are flap valves, the valve faces of which are approximately horizontal or at any rate deviate from the vertical. This enables the valves always to assume the proper position, irrespective of whether the apparatus is always held quite horizontally. If the valve faces were substantially vertical it would be possible for a valve to open at the wrong time, on the apparatus being held in a slightly inclined position, which cannot always be avoided when it is in use. For ensuring a reliable working of the apparatus, the valves must respond readily. For this reason they are formed as light flap valves. In order that they may not get stuck on their seating through the moisture which is condensed from the breath, they only rest on a narrow rim 9, which may be either on the valve face or on the valve seating.

The arrangement according to Figs. 5 and 6 differs from that according to Figs. 3 and 4 substantially by the main body of the apparatus being in this case made of metal. In order that the interior of the apparatus may be easily accessible for cleaning purposes, the apparatus is made in two parts joined together by a hinge 10. When the apparatus is closed the two parts are held together by a ring 11, which is slipped over the mouthpiece 3. The serrated strip 5 can also help to hold the apparatus together, by the fixing part 12 engaging in two slots, which are provided in the two halves of the apparatus.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A device for enabling a person to test the odour of his own breath, characterised by the feature, that a hollow space for the reception of the nose is adapted to the shape of the nose and terminates immediately below the nose and that at this place a connecting channel commences, which leads to the mouth by the shortest way.

2. A modification of the device claimed in Claim 1, characterised by the feature that the connecting channel is open at the top and is closed by placing the edges against the upper lip.

3. A device as claimed in Claim 1, characterised by the feature, that a valve is introduced into the path of the air to be inhaled into the nose between the mouth and the nose, which valve closes when the air is expired and prevents the expired air returning to the oral cavity, so that the expired air passes from the

nose into the atmosphere through a second valve which opens on the air being expired.

4. A device as claimed in Claim 1, characterised by the feature, that the main body of the device is made in two parts and that the two parts are rotatable about a common hinge.

5. A device as claimed in Claim 4, characterised by a clamping piece for holding the two halves together when the device is in use.

6. A device as claimed in Claim 1, characterised by a bow at the place that rests against the bridge of the nose, which bow acts as a carrier for packing material, such as wadding for fitting the device snugly on the bridge of the nose.

7. A device as claimed in Claim 1 and 6, characterised by the feature, that the bow, is serrated, so that the packing material wrapped on it is prevented from slipping off again.

8. A device as claimed in Claim 6, characterised by the feature, that the bow engages in two slots, one in each of the two halves of the device and thereby holds the device together when in use.

9. The device for enabling a person to test the odour of his own breath, constructed and operating substantially as hereinbefore described and as illustrated in and by the accompanying drawing.

Dated this 16th day of March, 1921.

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